

DERWENT-ACC-NO: 1999-145648

DERWENT-WEEK: 199916

COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: Liquid impregnation method for timber - involves blowing carbon dioxide with predetermined pressure into liquid before injecting it into timber

PATENT-ASSIGNEE: OKAYAMA OYO KAGAKU YG[OKAYN]

PRIORITY-DATA: 1997JP-0153174 (June 11, 1997)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 11000904 A	January 6, 1999	N/A	003	B27K 005/00

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 11000904A	N/A	1997JP-0153174	June 11, 1997

INT-CL (IPC): B27K003/02, B27K005/00

ABSTRACTED-PUB-NO: JP 11000904A

BASIC-ABSTRACT:

NOVELTY - Carbon dioxide is blown with a pressure of 0.1- 5kg/cm<sup>2</sup> into 500ml of liquid e.g. wood preservative, timber modifier, etc. before injecting the liquid into the timber. DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for another method of liquid impregnation in timber.

USE - For injecting timber improvement liquid, wood preservative, timber modifier into timber with ease.

ADVANTAGE - The method is energy saving, safe and inexpensive. Permeability of the timber is improved hence liquids are efficiently injected into the timber.

CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS: LIQUID IMPREGNATE METHOD TIMBER BLOW CARBON PREDETERMINED PRESSURE  
LIQUID INJECTION TIMBER

DERWENT-CLASS: C03 D22 E36 F09 P63

CPI-CODES: C05-C04; C11-C03; D09-A01; E31-N05C; F05-B01;

CHEMICAL-CODES:

**Chemical Indexing M2 \*01\***

Fragmentation Code

C106 C108 C530 C730 C800 C801 C802 C803 C805 C807

M411 M781 M903 M904 M910 N104 Q261 Q324 Q620

Specific Compounds

01066K 01066U

Registry Numbers

1066U

**Chemical Indexing M3 \*01\***

Fragmentation Code

C106 C108 C530 C730 C800 C801 C802 C803 C805 C807

M411 M781 M903 M904 M910 N104 Q261 Q324 Q620

Specific Compounds

01066K 01066U

Registry Numbers

1066U

**UNLINKED-DERWENT-REGISTRY-NUMBERS: 1066U**

**SECONDARY-ACC-NO:**

CPI Secondary Accession Numbers: C1999-042827

Non-CPI Secondary Accession Numbers: N1999-106123

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-000904

(43)Date of publication of application : 06.01.1999

---

(51)Int.Cl.

B27K 5/00

B27K 3/02

---

(21)Application number : 09-153174

(71)Applicant : OKAYAMA OYO KAGAKU:KK

(22)Date of filing : 11.06.1997

(72)Inventor : INOUE TADAMORO  
INOUE TAKESHI

---

### (54) IMPROVING TECHNIQUE OF LIQUID IMPREGNATION TO WOOD

#### (57)Abstract:

PROBLEM TO BE SOLVED: To ease the impregnating work of the preserving medicine of a wood, which is made difficult by being guided with a peculiar membranous substance presenting at the mouth edge part of a cell wall peculiar to the wood, by means of a wood preserving medicine.

SOLUTION: A liquid, in 500 ml of which 0.1-5 kgf/cm<sup>2</sup> of carbonic acid gas is dissolved, is infiltrated in a wood such as Oregon pine, pacific hemlock and cedar. The composition of the above-mentioned liquid contains 2-5 different materials or wood improvers such as colloidal silica, boric acid, water-soluble chitosen, aluminum hydroxide, bivalent copper, silver nitrate, zinc, chromium, anatase-type titanium oxide, resins, carbon compound, other ionized matters of inorganic substance and the like so as to realize an efficient impregnatingly solidified wood.

---

### LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's  
decision of rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

CLAIMS

---

[Claim(s)]

[Claim 1] It is related with the improvement technique in permeability to the wood of the liquid which blew 0.1-5kg/cm<sup>2</sup> of carbon dioxide gas to 500ml of liquids.

[Claim 2] It is related with the improvement in permeability to the wood of the liquid which dissolved 500ml of liquefaction carbon dioxides to 500ml of liquids.

[Claim 3] The improvement technique in permeability of processing 20-105-degree C temperature heating to the liquids and solutions with which the carbon dioxide gas of claims 1 and 2 and a liquefaction carbon dioxide melted, and processing 5-80kHz of supersonic waves into a liquid as warming.

[Claim 4] The matter which has melted into the liquid points out the wood preservative of carbon dioxide gas, a liquefaction carbon dioxide, and a mineral matter, an organic substance and a resin compound, a wood anti-ant agent, a wood flameproofing agent, and vegetable heredity breeding drugs.

---

[Translation done.]

## \* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

## DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention eases the functional film-like presentation of the plant tissue which checks the permeability of the matter to wood, and is the surface tension improvement technique of inorganic compounds, such as a wood preservative, a wood anti-ant agent, a wood flameproofing agent, a wood amelioration agent, a wood modifier, an energy-saving agent of wood, and vegetable heredity breeding culture drugs, an organic compound, and the liquefied object that promotes the permeability to the inside of the wood of the compound-ized liquid of these matter.

[0002]

[Description of the Prior Art] Although an underground water and storm sewage penetrate a cell wall and wood is used for living body physiology, when survived, Since the peristome cinclides of a cell wall close and it ceases to make water and air penetrate after end felling is carried out and moisture transpires, although the sinking-in technique of the wood preservation agent by various drugs is based also on tree species, the larch, the U.S. pine, the U.S. hemlock, and the Japanese red pine are especially known as bad tree species of typical permeability. Since it sinks in only about 2mm of a wood side face and a front face at most even if these trees carry out a vacuum and pressurization sinking in in of the drugs, the technique by physical energy, such as the in sizing method, a double diffusion test, an elevated temperature, high pressure, pressurization, and a milling process, is developed, some cell walls of wood are broken, and impregnation of drugs is made. However, it cannot perform sinking [ of overwhelming drugs ] in and the present condition is still that sinking in is performed for the thickness of about at most 5mm in laboratory evaluation. this thing -- the scene of a gene breeding technique (Japanese Patent Application No. 2-410649) -- the permeability of various plant hormone or the mineral matter -- with a rose -- uniform evaluation was not completed.

[0003]

[Problem(s) to be Solved by the Invention] Into wood, like a RAJATA pineapple, and a Japan cedar and a tulip tree, although there is also an object with extraordinarily sufficient impregnating ability, there are also many the U.S. pine, U.S. hemlocks, Japanese red pines, and tree species with which the bad thing of impregnating ability is known like a larch, and, as for the amount of sinking in of the wood preservation agent which sinks into such wood, a wood modifier, and resin system materials, only a depth of about 2mm can sink in.

[0004] Even if it repeats pressurization and a vacuum and sinks in drugs, on a wood side face, drugs have the trouble of not sinking into homogeneity by 5mm on the front face of wood at most. Therefore, to a decay bacillus or a termite, in a long period of time, it was easy to generate the vermin damage and decay of drugs sinking in to the wood to an uneven part, and there was a problem of being unable to perform a setup of the term of a guarantee.

[0005]

[Means for Solving the Problem] To such wood, the carbon dioxide gas of 3.1 - 3.5 kgf/cm<sup>2</sup> be blow into per [ in which the above-mentioned matter dissolved carbon dioxide gas and a liquefaction carbon

dioxide ] 500ml of liquids, and the permeability of the liquids and solutions to the inside of wood improve by [ of liquids and solutions ] carry out a surface tension fall so that a natural principle may be use and the permeability of a wood preservation agent, a wood structure reinforcement, inorganic and organic compound materials, and resin system materials may be promote, without hang energy cost.

[0006] As for that by which sinking-in immobilization was checked by high concentration, the permeability of inorganic substances, such as bivalence copper, diacid-ized iron, a silver nitrate, an aluminum hydroxide, a boric acid, colloidal silica, a magnesium hydroxide, magnesium acetate, and zinc, and these compounds was checked.

[0007] Furthermore, if 20-105-degree C warming is added to the liquid with which these presentations are dissolved as temperature for 1 to 48 hours, the surface tension of these liquids will decline at 30 - 80% of rate, and its permeability of the liquid to wood will improve 30 to 80%.

[0008] In order to reduce the surface tension of liquids and solutions and to raise permeability, using a supersonic wave together is also examined.

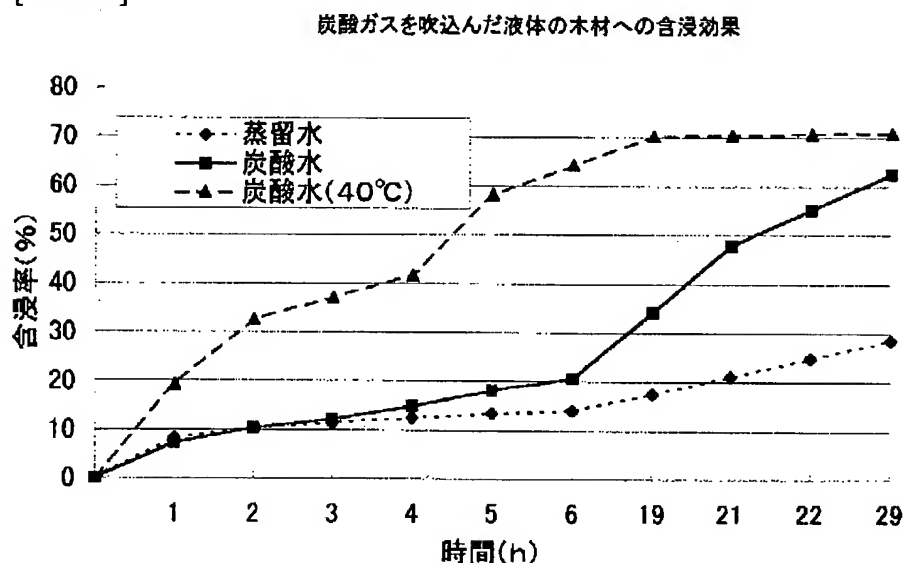
[0009]

[Example] An example explains this invention.

Example 1 Carbon dioxide gas 3.1 - 3.6 kgf/cm<sup>2</sup> were blown into 500ml distilled water, and the rate of impregnation to the wood at the time of applying 40 degrees C of temperature to the ordinary temperature of these aerated water and distilled water, ordinary pressure, and aerated water by ordinary pressure was measured. The range of pH 4.2-5 has [ the conditions of a liquid that the permeability of this liquid is promoted ] the highest osmosis effectiveness. These object divisions hang up the effectiveness of each permeability over Table 1 as an object of a comparison of distilled water.

[0010]

[Table 1]



[0011]

[Effect of the Invention] existence of the drugs to much wood, such as a wood preservation agent, wood surface plating technique, coating for wood, and wood physical addition agent on the strength, gets to know -- having -- \*\*\*\* -- these sinking-in techniques -- a vacuum -- although the - pressurization sinking-in method, the diffusion sinking-in method, the in sizing method, etc. are learned, a facility, energy efficiency, sinking-in effectiveness, etc. do not have any technique to dropping cost at a thing to the extent that the effectiveness is expected. This time, the technique discovered and developed is a liquid sinking-in technique of energy saving, insurance, and low facility cost, and is considered to be the technique which contributes to development of many forestry related companies etc.

Reference number Document specification which indicated 01 to NI-P10 chemical formula etc. [Table 1]

---

[Translation done.]



(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号

特開平11-904

(43)公開日 平成11年(1999) 1月6日

(51)Int.Cl.<sup>o</sup>

識別記号

F I

B 2 7 K 5/00

B 2 7 K 5/00

A

3/02

3/02

F

A

審査請求 未請求 請求項の数4 O L (全 3 頁)

(21)出願番号

特願平9-153174

(22)出願日

平成9年(1997) 6月11日

(71)出願人 396005841

有限会社岡山応用化学

福山市日吉台2丁目13番4-102号

(72)発明者 井上 唯師

広島県福山市日吉台2丁目13番4-102号

(72)発明者 井上 猛

広島県福山市日吉台2丁目13番4-102号

(54)【発明の名称】 木材への液体の注入性向上技術

(57)【要約】 (修正有)

【課題】木材保存薬剤は木材特有の細胞壁の口縁部に存在する特異的な膜様物質により、ガードされており、木材の保存剤含浸加工を難しくしている。

【解決手段】液体500mlに炭酸ガスを3.1~3.6kgf/cm<sup>2</sup>吹き込み、木材(米マツ・米ツガ・スギ)へ浸透させる。液体の組成には、コロイダルシリカ、ホウ酸、水溶性キトサン、水酸化アルミニウム、二価銅、硝酸銀、二酸化鉄、亜鉛、クロム、酸化アナターゼチタン、樹脂類、炭素化合物、その他無機物質のイオン化合物の木材改良剤などの物質の2乃至5種類が含まれ効率良く含浸固定化される。

## 【特許請求の範囲】

【請求項1】 液体500mlに対して炭酸ガスを0.1〜5kgf/cm<sup>2</sup>吹込んだ液体の、木材への浸透性向上技術に関する。

【請求項2】 液体500mlに対して液化二酸化炭素を500ml溶解した液体の木材への浸透性向上に関する。

【請求項3】 請求項1及び2の炭酸ガス及び液化二酸化炭素の溶け込んだ液剤に加温として20〜105℃の温度加熱、及び液体に超音波5〜80KHzを処理する浸透性向上技術。

【請求項4】 液体に溶け込んでいる物質が、炭酸ガス・液化二酸化炭素及び無機物質・有機物質・樹脂化合物の木材防腐剤、木材防蟻剤、木材難燃化剤、植物遺伝育種薬剤を指す。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は木材への物質の浸透性を阻害する植物組織の機能性膜状組成を緩和して、木材防腐剤、木材防蟻剤、木材難燃化剤、木材改良剤、木材改質剤、木材の省エネルギー化剤、植物の遺伝育種培養薬剤などの無機化合物、有機化合物、これら物質の複合化液体の木材中への浸透性を促進する液状物の表面張力改善技術である。

## 【0002】

【従来の技術】木材は生存しているときには、地下水や雨水が細胞壁を透過して、生体生理に利用されているが、一端伐採され水分の蒸散した後、細胞壁の口縁壁孔が閉じ、水も空気も透過させないようになるので、各種薬剤による木材保存剤の含浸技術は樹種にもよるが、カラマツ、米マツ、米ツガ、赤松は、特に代表的な浸透性の悪い樹種として知られている。これらの樹木は、薬剤を真空・加圧含浸しても、精々木材側面・表面の2mm程度しか含浸されないで、インサイジング法や二重拡散法、高温、高圧、加圧、圧搾法、などの物理的エネルギーによる技術が開発され、木材の細胞壁の一部を壊して薬剤の注入がなされている。しかしそれでも圧倒的な薬剤の含浸は出来なく、実験室評価では精々5mm程度の厚さしか、含浸が行われていないのが現状である。この事は、遺伝子育種技術（特願平2-410649）の場面でも各種植物ホルモンやミネラル物質の透過性がバラ付き均一な評価が出来なかった。

## 【0003】

【発明が解決しようとする課題】木材の中には、ラジャータパインや、スギ、ユリノキのように、特別含浸性が良い物もあるが、米マツ、米ツガ、赤松、カラマツのように含浸性の悪い事が知られている樹種も多く、これらの木材に含浸される木材保存剤、木材改質剤、樹脂系資材の含浸量は、2mm程度の深さしか含浸出来ない。

【0004】加圧と真空を繰り返し薬剤を含浸しても木材側面では、精々木材表面の5mmで、薬剤は均一に含浸されないなどの問題点がある。其の為に腐朽菌やシロアリに対して長期間では薬剤含浸の不均一な箇所への木材への食害や腐朽が発生し易く、保証期間の設定が出来ないなどの問題があった。

## 【0005】

【課題を解決するための手段】このような木材に対して、自然の原理を利用し、エネルギーコストを掛けずに木材保存剤、木材構造強化剤、無機・有機の複合資材、樹脂系資材の浸透性を促進させるように、炭酸ガス及び液化二酸化炭素を前述の物質の溶解した液体500ml当たり、3.1〜3.5kgf/cm<sup>2</sup>の炭酸ガスを吹き込み、液剤の表面張力低下させる事により、木材中の液剤の浸透性が向上する。

【0006】高濃度で含浸固定化が確認されたものは、二価銅、二酸化鉄、硝酸銀、水酸化アルミニウム、ホウ酸、コロイダルシリカ、水酸化マグネシウム、酢酸マグネシウム、亜鉛などの無機物及びこれらの化合物の浸透性が確認された。

【0007】更にこれらの組成が溶存する液体に温度として、20〜105℃の加温を1〜48時間加えると、これらの液体の表面張力は、30〜80%の速度で低下して木材への液体の浸透性が30〜80%向上する。

【0008】液剤の表面張力を低下させ浸透性を高めるには、その他超音波を併用する事も検討される。

## 【0009】

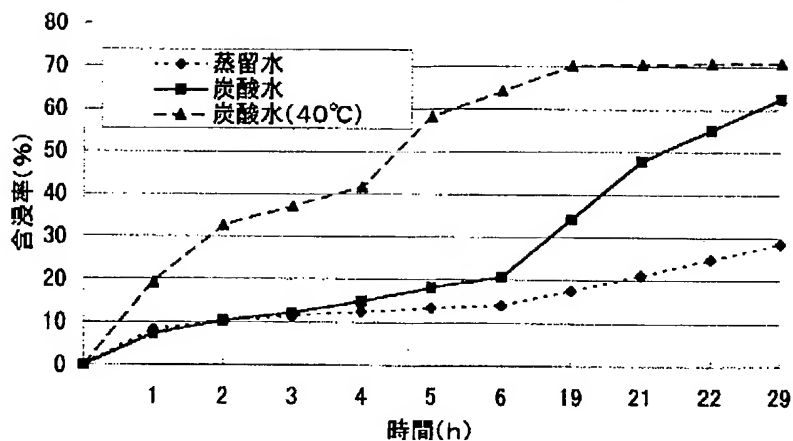
【実施例】実施例により本発明を説明する。

実施例1 炭酸ガス3.1〜3.6kgf/cm<sup>2</sup>を500mlの蒸留水に吹き込み、これらの炭酸水と蒸留水の常温、常圧及び炭酸水に常圧で温度を40℃加えた場合の木材への含浸率を測定した。この液体の浸透性が促進される液体の条件はpH4.2〜5の範囲が一番浸透効率が高い。これらの対象区は蒸留水を比較の対象として、各浸透性の効率を表1に掲げる。

## 【0010】

## 【表1】

炭酸ガスを吹込んだ液体の木材への含浸効果



## 【0011】

【発明の効果】木材保存剤、木材表面メッキ技術、木材用塗料、木材物理的強度付加剤など多くの木材に対する薬剤の存在が知られており、これらの含浸技術には、真空・加圧含浸法・拡散含浸法・インサイジング法などが知られているが、いずれの技術も設備、エネルギー効率、含浸効率等は投下コストに対して、その効果は期待するほどのものではない。今回、発見、開発した技術 \*

\*は、省エネルギー、安全、低設備コストの液体含浸技術で、多くの林業関連企業などの発展に寄与する技術と考える。

整理番号 NI-P01-10

20 化学式等を記載した書面

明細書

【表1】